

[11] Patent Number: 5,792,261

[45] Date of Patent: *Aug. 11, 1998

5,167,717 12/1992 Boimott 118/724
5,280,154 1/1994 Cuomo et al. 219/121.52
5,326,404 7/1994 Sato 118/723 MR
5,413,684 5/1995 Bergmann 204/192.13
5,494,522 2/1996 Moriya et al. 118/719
5,542,559 8/1996 Kawakami et al. 216/67
5,580,385 12/1996 Paranjpe et al. 118/723 I

Primary Examiner—R. Bruce Breneman

Assistant Examiner—Luz Alejandro

Attorney, Agent, or Firm—Oblon, Spivak, McClelland,
Maier & Neustadt, P.C.

[57] ABSTRACT

A plasma CVD apparatus for forming a silicon film on an LCD substrate includes a container which is divided into process and upper chambers by a quartz partition plate. A work table on which the substrate is mounted is arranged in the process chamber and a lower electrode to which a high frequency potential is applied is arranged in the work table. First lower and second upper supply heads are arranged between the partition plate and the work table in the process chamber. SiH_4 and H_2 gas and He gases are supplied through the first and second supply heads. He gas is transformed into plasma while SiH_4 and H_2 gas is excited and decomposed by the plasma thus formed. Two coils are arranged in the upper chamber and high frequency voltages are applied to the coils to generate electromagnetic field to induce the transforming of He gas into plasma. High frequency voltages applied to the coils are the same in phase and directions of current flowing through adjacent portions of the coils are the same.

16 Claims, 10 Drawing Sheets

09478370-010600